

# The GEOSS User Requirement Registry (URR): Supporting Work Plan Implementation and a User-Driven GEOSS

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# The GEOSS User Requirement Registry (URR): Supporting Work Plan Implementation and a User-Driven GEOSS

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# A User-Driven System of Systems

10 Year Implementation Plan for the Global Earth Observing System of Systems (GEOSS):

- build GEOSS as a user-driven system of systems;
- develop a User Requirement Registry;
- frequently review the user needs as a basis for gap analysis.

User Requirement Registry (URR) development started in 2006:

- extensive discussions on the data model;
- specification of the functionality.

In parallel, a review of user requirements was carried out; based on published documents.

Implementation of the URR started in 2009; made significant progress in 2010.

First experience with populating the URR; using experts and the result of the review.

Concept of Operation (CoO) was developed in 2011: specifies the final functionality of the URR.

Finalization of the URR according to the CoO planned for 2012.

# A User-Driven System of Systems

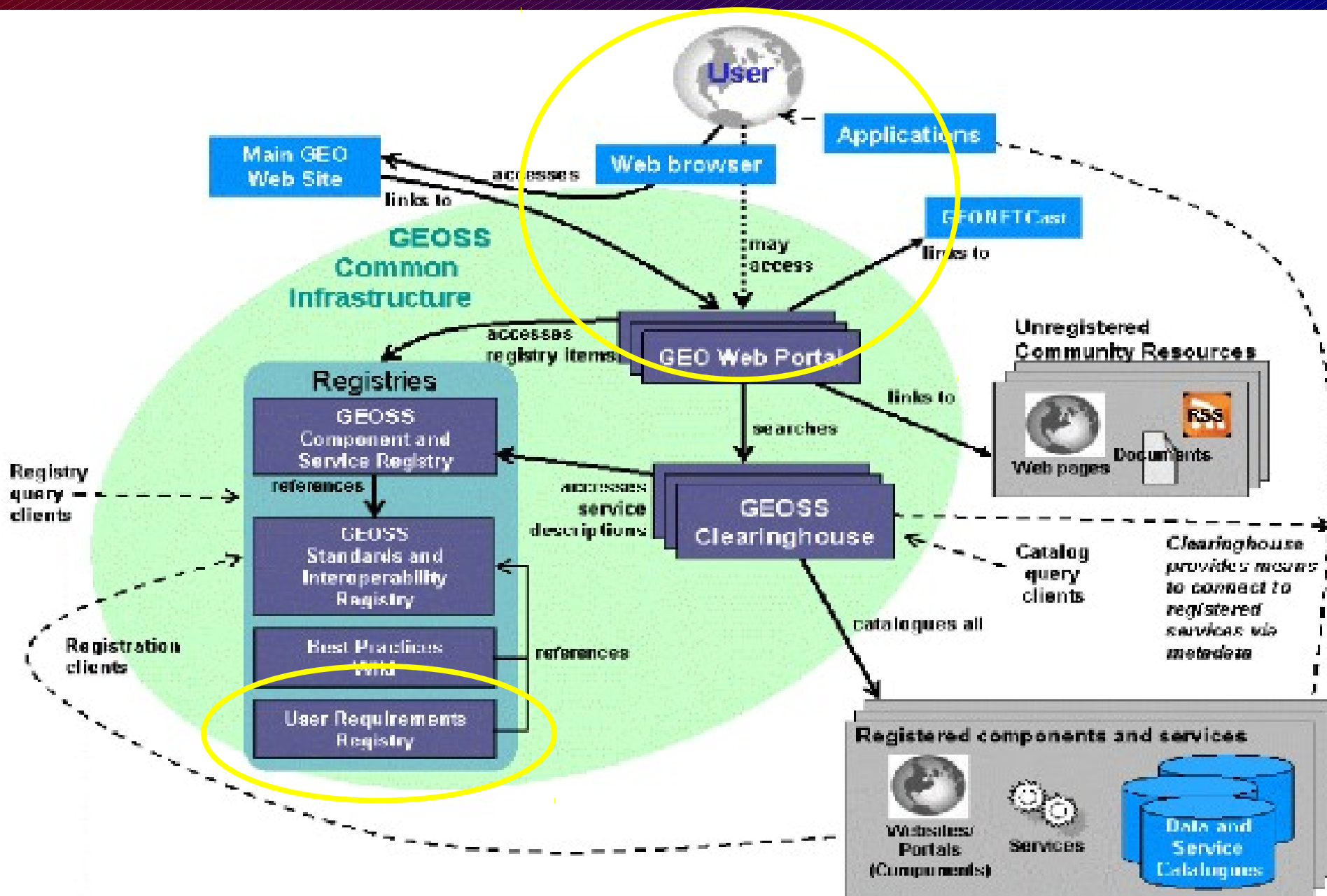
*The experience over the last years made clear:*

Collecting information on user needs and translating them into requirements for the observing system is not a straight-forward task.

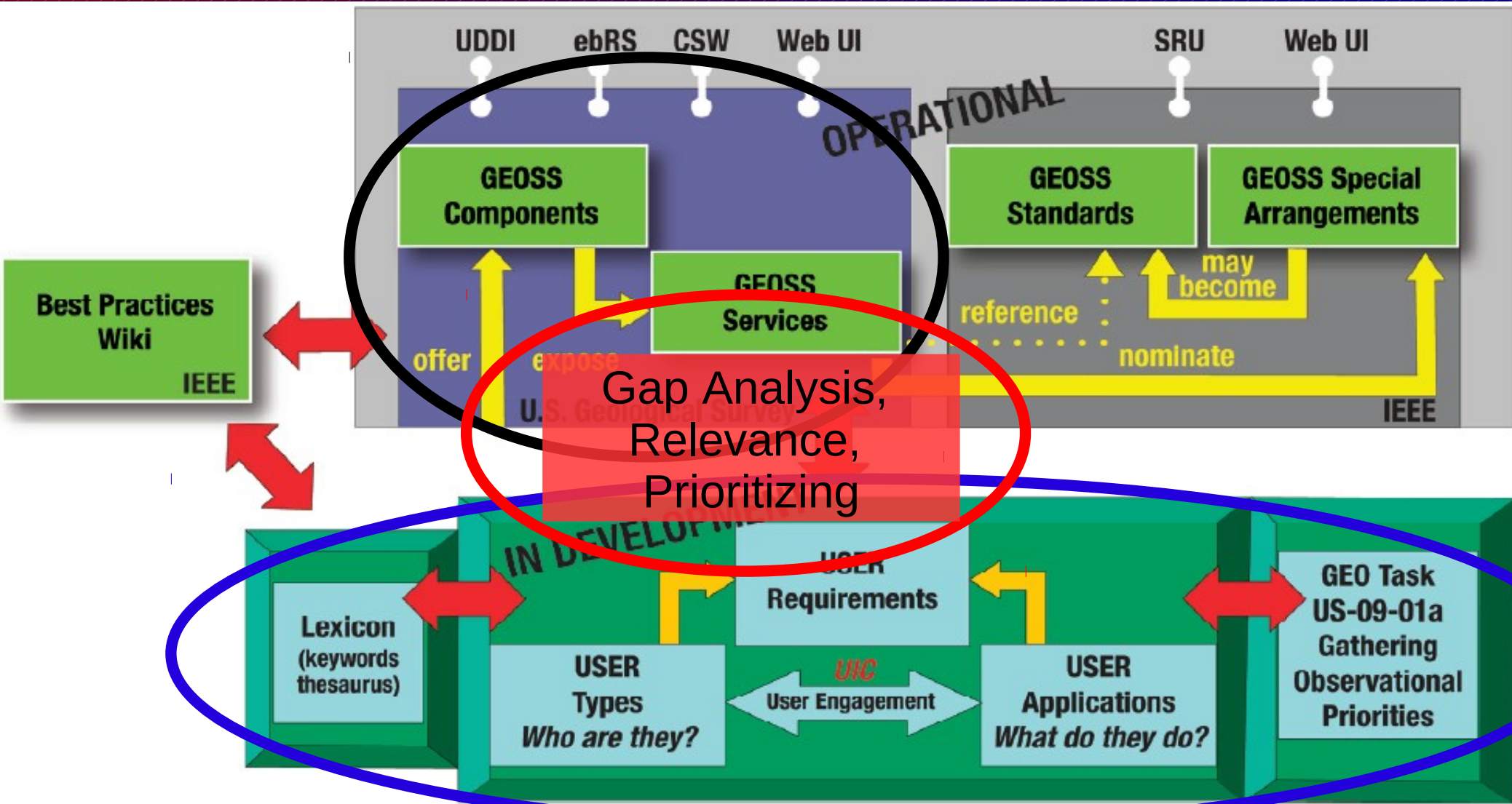
The process for collecting user needs and requirements and the registry need to:

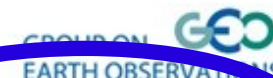
- reach out to global users;
- enable users to express their needs;
- be flexible, adaptable, proactive, versatile, comprehensive;
- allow for frequent (gap) analysis.

# GEOSS Registries and User Requirement Registry



# GEOSS Registries and User Requirement Registry



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## Home

The intergovernmental Group on Earth Observations (GEO) is implementing the Global Earth Observation System of Systems (GEOSS) and developing tools to help users better understand earth observation data to a variety of societal areas. A suite of GEOSS Registries is at the core of these tools. These registries provide the means to register GEOSS components, services, data sets, and other relevant information resources. They are designed to enable users of Earth observations to access, list, search, and use the data and services available through GEOSS.

GEO is building GEOSS as a user-driven system. The GEO User Requirements Registry (URR), which is part of the GEOSS Registries, allows users to publish their needs in terms of Earth information, and it enables users and providers to analyze the value chains from Earth observations to end users. In order to collect and update information on user needs, GEO has established several processes to engage users depending directly or indirectly on Earth observations. The URR is one of the principal user engagement mechanisms in GEOSS. The core of the URR is a comprehensive database with information on user types, applications, and requirements as well as their inter-connectivity.

A key innovative feature of the URR is its capacity to generate and analyze links between the different types of functions—User Types, Applications, Requirements, Research Needs, Technology Needs, Infrastructure Needs, and Capacity Building Needs. Creating these connections allows publishers (those entering data) and readers (those viewing data) to understand the interconnected nature of the various functions. Relationships between functions can be viewed in the URR Links page and illustrated graphically within each URR form. [Figure 1](#) illustrates a representative Links visualization, showing a "User Type" (Aerobiologist; yellow circle) linked to an "Application" (Land-use management; blue circle) that is in turn related to various "Requirements" (e.g., Biogeochemical assessment and Ecosystem health assessment; green circles). Selecting other elements in the image will then display a new network of links originating from the selected entity. Documenting links between these different elements demonstrate the unique URR relationship capability and should help URR users make more informed decisions.

Population of the URR is based on peer contribution similar to the Wikipedia system. Moreover, relevant information from the reports produced by the GEO Work Plan Task US-09-01a has been extracted and entered into the URR. Engineers, scientists and policy makers world-wide who contributed the US-09-01a reports are being asked to assist in populating the URR. As far as possible, information is also harvested from other databases with information on user needs. But the biggest contribution will have to come from individual users who publish their needs. Please view this recent [URR publication](#) for more information.

You are invited to visit and search the URR for information related to user needs, applications, and observational requirements. If you have information on these items, you are invited to

**GEOSS User Requirements Registry: Tutorials**

Welcome to the tutorials for the GEOSS User Requirements Registry (URR). The URR is a utility that allows the viewing, publishing, and analyzing of user needs in terms of Earth observations and related information. The Tutorials provided here will walk you through the menus of the URR. Main emphasis is on the publishing of new information.

The forms of the URR allow the publishing of information on User Types, Applications, Requirements, Research Needs, Technology Needs, Infrastructure Needs, and Capacity Needs as they relate to decision making and Earth observations. The URR also collects the terms used to describe these entities, and references with more detailed information of each of the entries in the forms can be provided. Information of how the entries in the various forms are interconnected is captured in a Link form, where each entry describes the linkage between any pair of entries in the other forms. For a definition of the entities mentioned here, see the [glossary](#).

In the View menu, you can view individual entries in any of the URR forms, you can generate reports with several entries, and you can export the result of a search for processing with other programs. The Publish menu provides the forms that allow you to add new entries or to edit existing ones. The Analyze menu will provide the function to construct and analysis the networks, which connect Earth observations to end users, and which illustrate the interdependence of applications and user types. In the Preferences menu, you can customize the URR to your personal needs and preferences. The Login function allows you to register as a user of the URR and to login, which then comes with a number of added functions and conveniences not available to anonymous users.

The tutorials provided here will introduce you to the publishing, viewing, and analyzing of URR contents. Particularly the tutorials for the Publish menu are detailed and will walk you through the various work steps of publishing User Types, Applications, Requirements, Research Needs, Technology Links, Lexicon Terms, and References. By doing so, the tutorials explain the concepts behind the URR and give guidance on how to describe individual entities and distinguish them from other similar entities.

The following tutorials are currently available:

- [General](#): General properties of the URR
- [View](#): Searching the URR, viewing entries, and exporting them.
- [Publish](#): Publishing new, and editing existing, entries.
- [Analyses](#): Analyzing the URR contents.
- [Preferences](#): Specifying preferences and developing personal portfolios.
- [Login](#): Registering as a user of the URR and utilizing the benefits of a registered user.
- [Prepare Input](#): Comments on preparing input for the URR and examples.

Note that a [brief introduction](#) to the URR is also available for those who do not want to consult the detailed tutorials.


The following documents and articles provide background information on the URR and the data model of the URR:

- \* [General](#): General properties of the URR
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## Publish

Welcome to the publishing section of the URR.

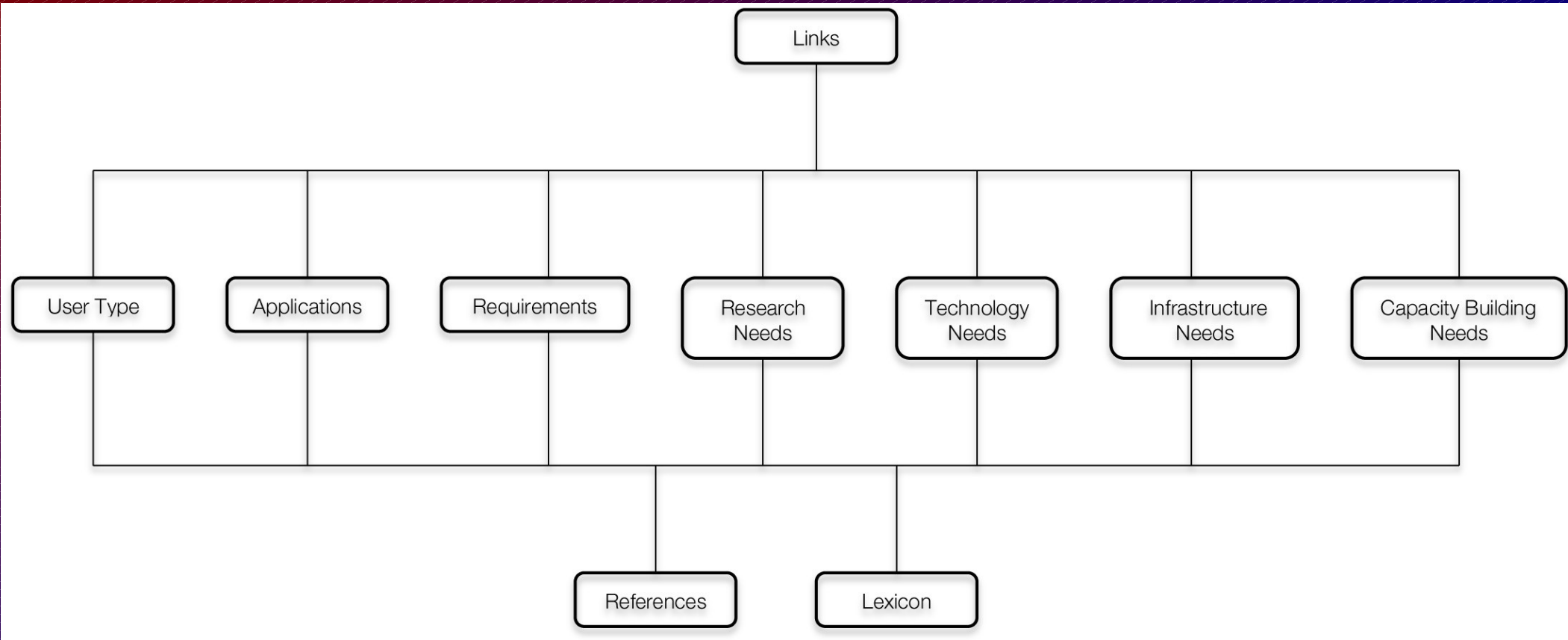
The URR provides extensive in-line help functions with each publishing form. Each input field comes with a  symbol. Clicking on this symbol opens a window with helpful information on the type of input asked for and, if applicable, general and practical constraints and other considerations to be taken into account.

The URR aims to capture information that is as far as possible generic and not specialized to individual users or applications, or selected countries or regions. Therefore, the language used should be general enough to be applicable in all parts of the world, taking into account that terminology may have some geographical variations. The resolution of the entries should be chosen carefully in order not to over or under-sample the different entities. It is important to keep in mind that the goal of the URR is to capture user needs related to, and in support of, their decision making in terms of Earth observations or derived information.

Please Note: The URR is in development and subject to constant changes and service interruptions.

[GEO Homepage](#)

# The URR Data Model

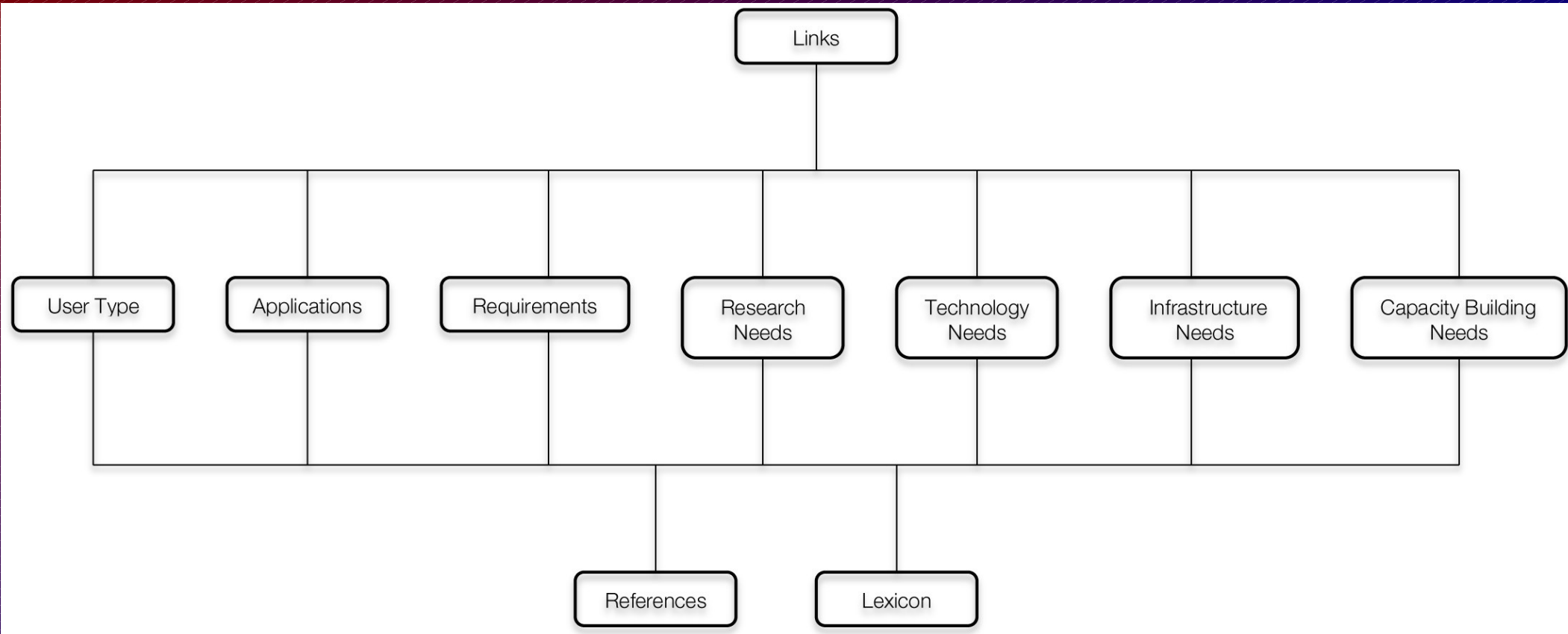


**Applications:** processes and activities that use Earth observations or derived information to produce new information, arrive at decisions, or execute decisions.

**User Types:** generic users who are involved in applications, benefit from these, or contribute to them.

**Requirements:** specifications of observations or derived products.

# The URR Data Model



**Research Needs:** research tasks to be performed in order to enable applications that are currently not possible due to a lack of knowledge.

**Technology Needs:** description of technology to carry out needed observations.

**Infrastructure Needs:** description of infrastructure necessary to meet requirements that are currently not met.

**Capacity Needs:** description of capacity building that would enable applications.

# The URR Data Model

**Applications:** processes and activities that use Earth observations or derived information to produce new information, arrive at decisions, or execute decisions.

**User Types:** generic users who are involved in applications, benefit from these, or contribute to them.

**Requirements:** specifications of observations or derived products.

**Research Needs:** research tasks to be performed in order to enable applications that are currently not possible due to a lack of knowledge.

**Technology Needs:** description of preferably observational requirements that cannot be met because the necessary technology to carry out the observations is not available and a description of what this technology would be.

**Infrastructure Needs:** description of requirements that cannot be met or applications that can not take place because of the lack of infrastructure and a description of the infrastructure necessary to enable the applications.

**Capacity Needs:** description of problems that in parts or globally cannot be solved today because of a lack of capacity in terms of organizational or human resources and a description of the necessary capacity building that would enable applications addressing these problems.

# The URR Data Model

Auxiliary registries:

**References:** collects all references to documents (publications, reports, web pages, etc.) that are used to link entries to more detailed background information.

**Lexicon:** collects all terms used in the URR.

## Controlled Vocabularies

- definition of acronyms and abbreviations;
- keywords;
- Earth observation parameters;
- units of observation parameters or other quantities;
- media;
- attributes of observations.

Capturing Interconnectivity:

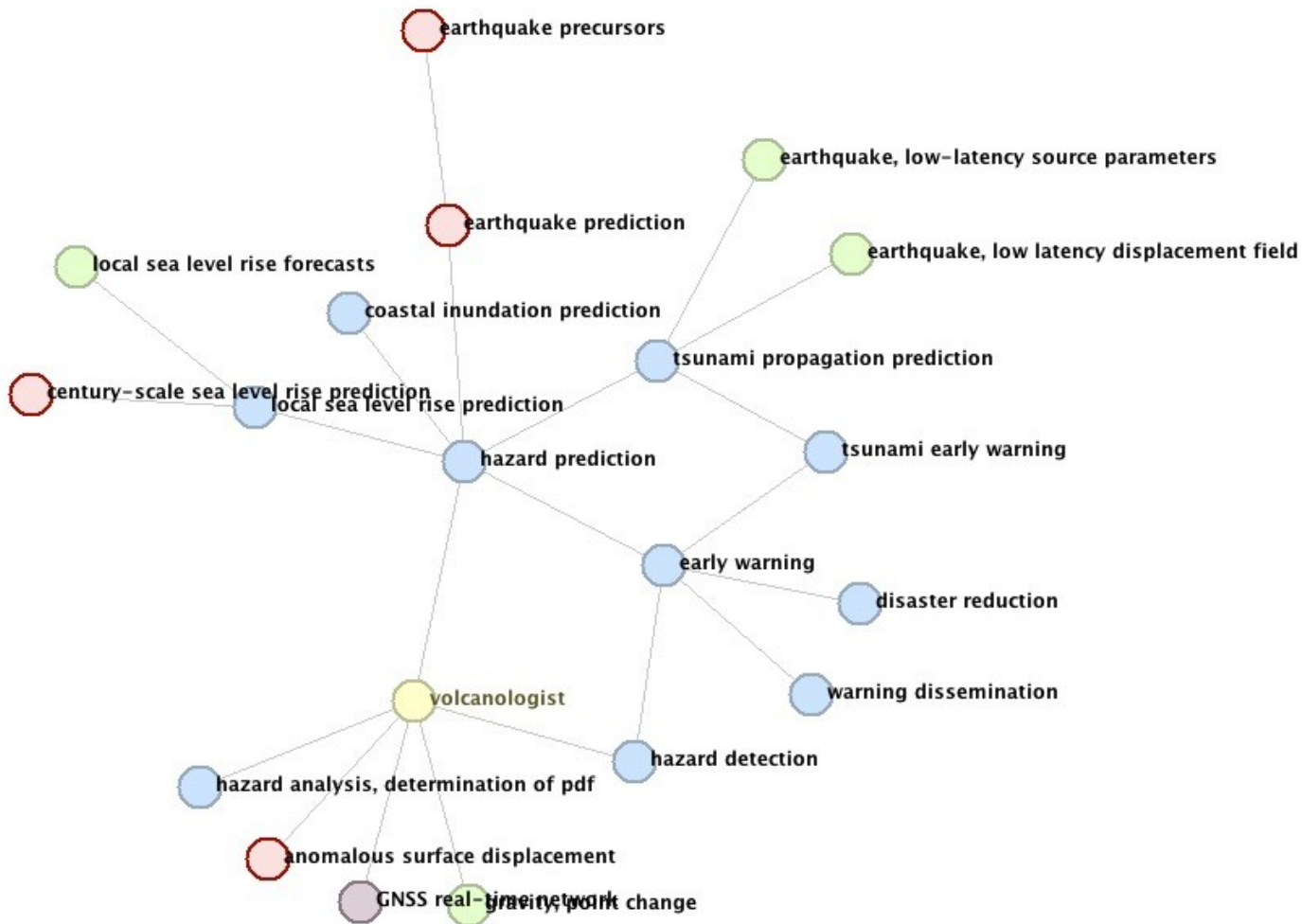
**Links:** connect a source and target entries in two different or the same form.

# The URR Data Model

Link concept turned out to be very powerful to capture connectivity between different elements.

Allows the construction of value chains and networks of value chains from Earth observations to end users.

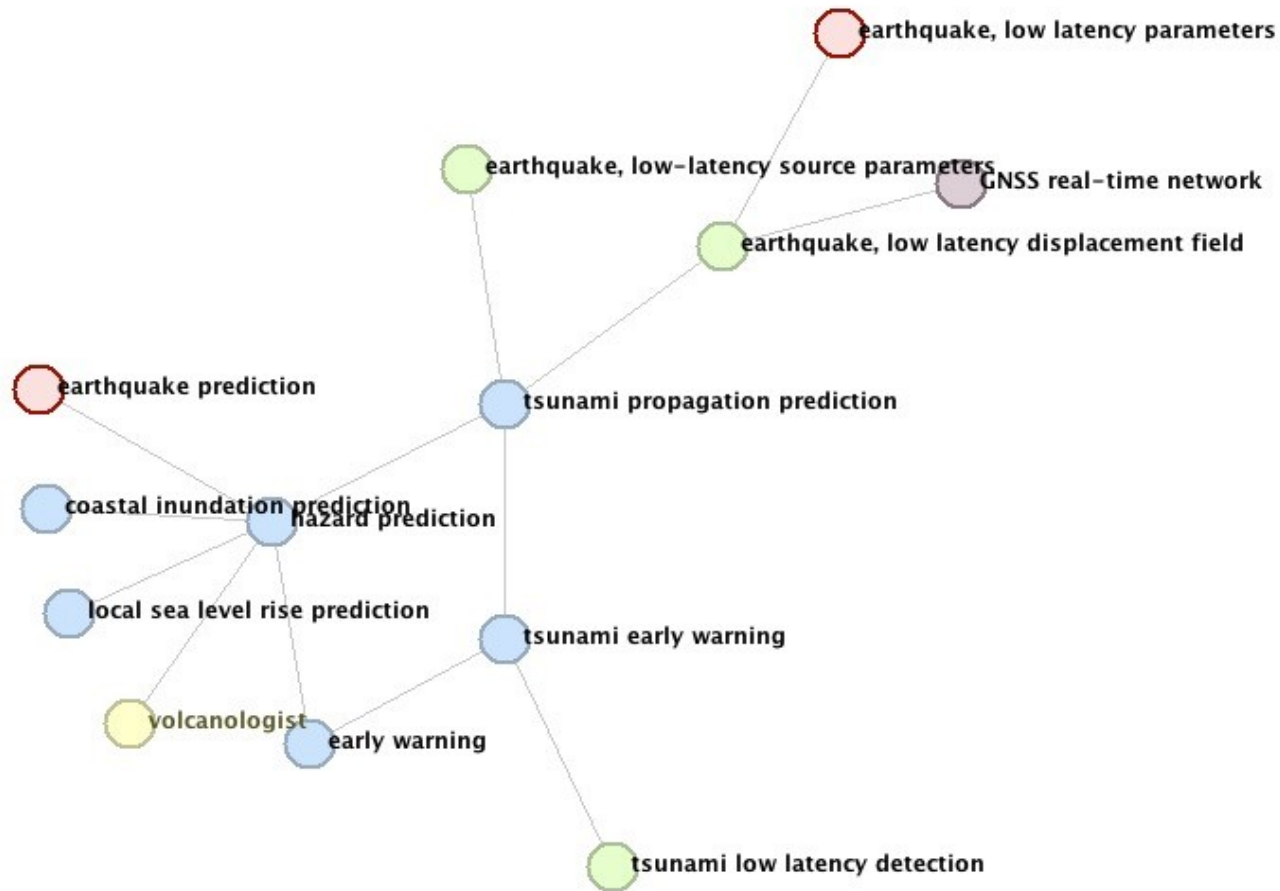
# Exploring Interdependencies



## LEGEND:



# Exploring Interdependencies

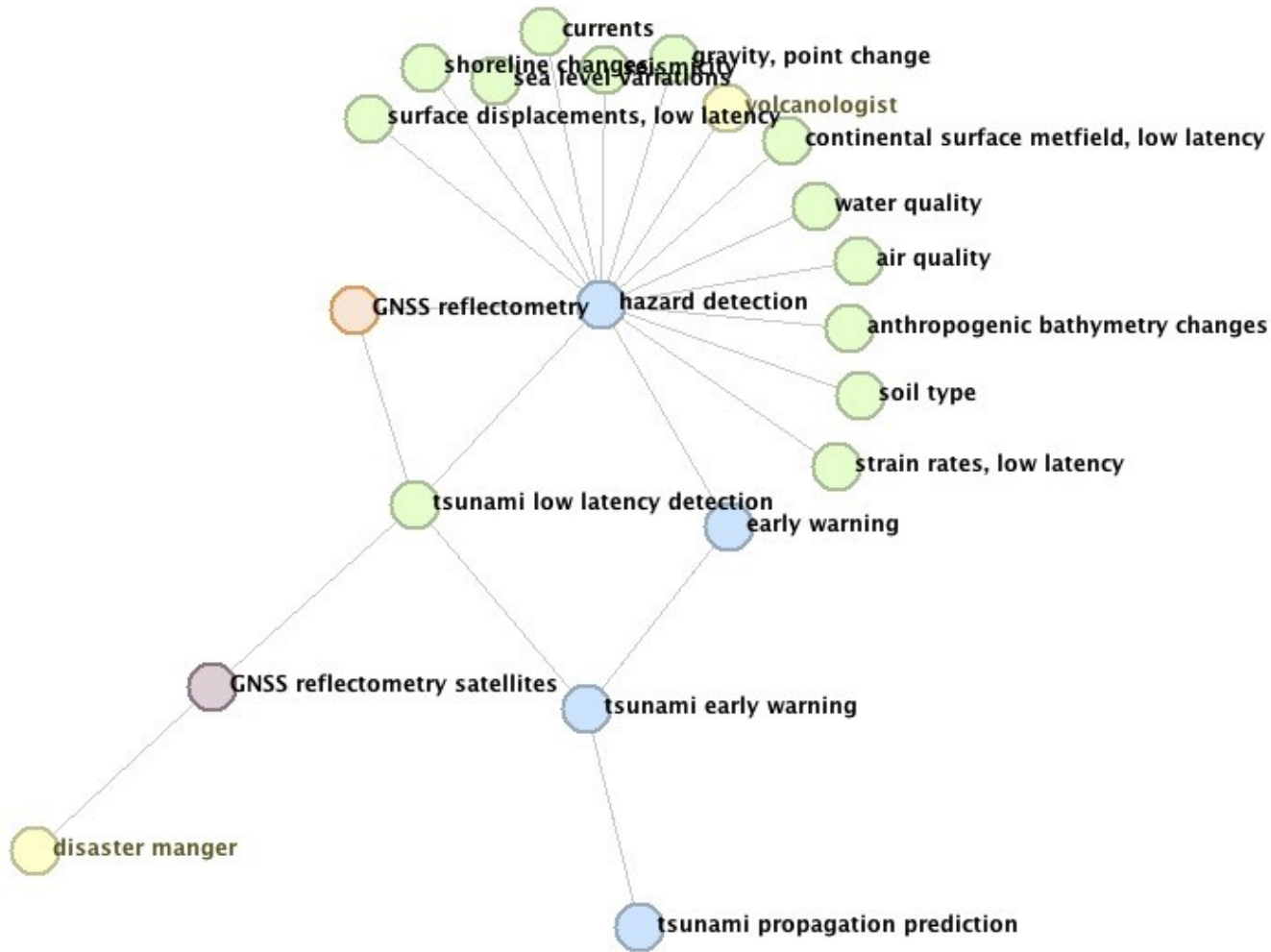


## LEGEND:





# Exploring Interdependencies



## LEGEND:



# Analyses Using the URR

## **Analysis goals:**

- Prioritization: importance of requirements, applications, user types, ...
- Gap analysis: which requirements are (not) met?
- Relevance analysis: which applications/users/research ... need this data sets?

## **Prioritization - URR internal:**

- What user types and applications depend on this requirement?
- What data products are needed for this application?
- What research is needed to enable this application?

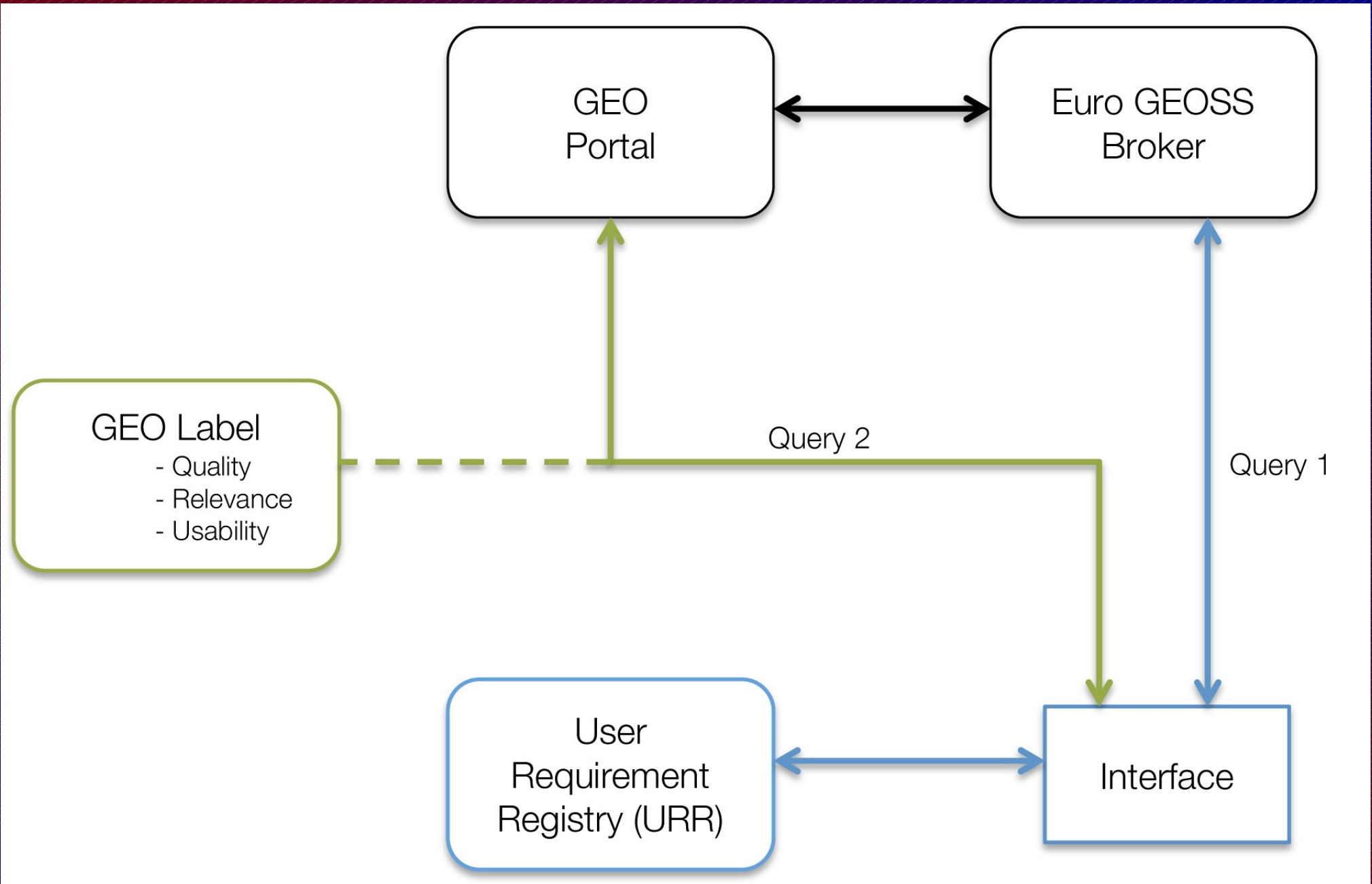
## **Gap Analysis - URR to Broker (Query 1):**

- Are there data products that would meet my needs?

## **Relevance Analysis – GEO Portal to URR (Query 2):**

- Who is using my data for what?

# Analyses Using the URR



# Concept of Operation

## Concept of Operation Document:

Describes the anticipated functionality, design, and administration of the URR by the end of 2012.

## Goals:

- All menus fully implemented
- Login required for publishing
- Login optional for all other actions
- Preferences available for customizing the URR
- Advanced graphical interface available
- More SBAs published
- Gap analysis possible
- Editing procedure established
  - *What level of editing is needed?*
  - *Who should be involved as editors?*

# Approach to Populating the URR

Approach has four elements:

- (1) Assessment Reports (e.g., US-09-01a)
- (2) Open peer contributions (Wikipedia approach)
- (3) Harvesting existing registries
- (4) Interviews

For (1) and (2) considerable issues in understanding Applications, User Types, Requirements, Links emerged

Reaction: On-line Tutorials; WebEx tutorials. What else?

Large difference in the quality of the entries

**Conclusion:**

There is a need for reviewing and editing of entries.

# Approach to Populating the URR

## Challenge:

Spam: Between 28 September and 10 October five entries were visibly overwritten.

## Response:

Require login for publishers.

## Challenge:

URR data model differs from most published documents and existing data bases.

## Response:

Requires analysis of an area prior to publishing